Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (original) A method of routing data packets through a switch fabric, each data packet having a corresponding switch processing parameter (SPP), said method comprising the steps of:

a) receiving a plurality of data packets;

b) queuing a plurality of data packets into a plurality of data packet queues according to their corresponding SPPs such that data packets sharing a common corresponding SPP are commonly-queued;

c) creating train packets from commonly-queued data packets, each train packet comprising a payload and a header, wherein the train packet creating step includes encapsulating a plurality of commonly-queued data packets within the payload of at least one train packet and encapsulating the SPP corresponding to each data packet encapsulated in the train packet payload within the train packet header; and

d) routing each train packet through the switch fabric as specified by its encapsulated SPP.

2. (currently amended) The method of claim ~~1~~ 58 wherein the train packet creating step includes the step of creating a train packet from at least some of the data packets in a data packet queue if the data packets queued therein have an aggregate length greater than or equal to a pre-selected maximum threshold value.

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5. (currently amended) The method of claim ~~1~~ 58 further comprising controlling the train packet creating step with a plurality of timer thresholds, each timer threshold being configured to control a different property in the creation of a particular train packet, and wherein ~~the train packet creating step includes the step of creating a train packet from whatever is queued in a non-empty data packet queue~~ upon passage of ~~a~~ one of the plurality of pre-selected timer thresholds ~~period~~ a train packet is created from whatever is queued in a non-empty data packet queue ~~after which that data packet queue became non-empty~~.

6. (currently amended) The method of claim ~~1~~ 5 wherein each train packet has a minimum length, and wherein the train packet creating step comprises creating a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets is less than the minimum train packet length ~~payload is comprised of a plurality of payload blocks, and wherein the train packet payload encapsulating step includes encapsulating within each payload block either a plurality of data packets, a single data packet, a portion of a data packet, padding, or some combination thereof~~.

7. (currently amended) The method of claim ~~1~~ 58 further comprising the step of:

once the train packet has been routed through the switch fabric, extracting from the train packet each data packet contained therein.

8. (currently amended) The method of claim ~~1~~ 58 further comprising the steps of:

sorting the data packets into a plurality of distribution classes according to a predetermined set of distribution criteria; and

wherein the queuing step ~~is preformed~~ comprises performing the queuing step upon only ~~upon~~ the data packets sorted into less than all but at least one of said distribution classes.

9. (currently amended) The method of claim ~~1~~ 58 further comprising the steps of:

sorting the data packets into a plurality of distribution classes according to a predetermined set of distribution criteria; and

wherein the queuing step ~~is performed~~ comprises performing the queuing step independently for each distribution class upon the data packets sorted into each of said distribution classes.

10. (currently amended) A method of routing data packets through a switch fabric having a plurality of switch planes, each data packet having a corresponding switch processing parameter (SPP), said method comprising the steps of:

a) receiving a plurality of data packets;

b) queuing a plurality of data packets into a plurality of data packet queues according to their corresponding SPPs such that data packets sharing a common corresponding SPP are queued within the same data packet queue;

c) creating train packets from commonly-queued data packets, each train packet comprising a payload and a header, wherein the train packet creating step includes encapsulating a plurality of commonly-queued data packets within the payload of at least one train packet and encapsulating the common SPP corresponding to each data packet encapsulated in the train packet payload within the train packet header;

d) for each train packet, creating a set of N subtrain packets, each subtrain packet comprising a subtrain payload and a subtrain header, wherein the step of creating a subtrain packet set includes creating the subtrain payloads by slicing each train packet payload into N slices, wherein each slice comprises a subtrain payload, and encapsulating within each subtrain header the SPP encapsulated within the train packet header of the train packet from which the set of subtrain packets was sliced; and

e) routing each subtrain packet within a set of subtrain packets through a different switch plane within the switch fabric as specified by its encapsulated SPP.

11. (currently amended) The method of claim ~~10~~ 61 wherein the train packet creating step includes the step of creating a train packet from at least some of the data packets in a data packet queue if the data packets queued therein have an aggregate length greater than or equal to a pre-selected maximum threshold value.

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14. (currently amended) The method of claim ~~10~~ 61 further comprising controlling the train packet creating step with a plurality of timer thresholds, each timer threshold being configured to control a different property in the creation of a particular train packet, and wherein ~~the train packet creating step further includes the step of creating a train packet from whatever is queued in a non-empty data packet queue~~ upon passage of ~~a~~ one of a plurality of pre-selected timer thresholds ~~period~~ a train packet is created from whatever is queued in a non-empty data packet queue ~~after which that data packet queue became non-empty~~.

15. (currently amended) The method of claim ~~10~~ 14 wherein each train packet has a minimum length, and wherein the train packet creating step comprises creating a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets does is less than the minimum train packet length ~~payload is comprised of a plurality of payload blocks, and wherein the train packet payload encapsulating step includes encapsulating within each payload block either a plurality of data packets, a single data packet, a portion of a data packet, padding, or some combination thereof~~.

16. (currently amended) The method of claim ~~10~~ 61 further comprising the steps of:

once each subtrain packet within a set of subtrain packets has been routed through a switch plane, reassembling the train packet from which that set of subtrain packets was created; and extracting each data packet from the reassembled train packet.

17. (currently amended) The method of claim ~~10~~ 61 further comprising the step of sorting the data packets into a plurality of distribution classes according to a predetermined set of distribution criteria, and wherein the queuing step ~~is preformed~~ comprises performing the queuing step upon only ~~upon~~ the data packets sorted into less than all but at least one of said distribution classes.

18. (currently amended) The method of claim ~~10~~ 61 further comprising the step of sorting the data packets into a plurality of distribution classes according to a predetermined set of distribution criteria, and wherein the queuing step ~~is preformed~~ comprises performing the queuing step independently for each distribution class upon the data packets sorted into each of said distribution classes.

19. (original) A switch for routing data packets between a plurality of switch inputs and a plurality of switch outputs, each of said data packets having a corresponding switch processing parameter (SPP), said switch comprising:

a) a plurality of packet formatters for queuing together data packets sharing a common corresponding SPP, creating train packets from the commonly-queued data packets, and providing the train packets to a switch fabric, wherein each train packet comprises a payload and a header, wherein the payload of at least one train packet includes a plurality of commonly-queued data packets, and wherein the header of each train packet includes the common SPP corresponding to each data packet included in the payload of that train packet;

b) the switch fabric having a plurality of switch fabric inputs for receiving train packets provided by the packet formatters and a plurality of switch fabric outputs for outputting routed train packets, wherein the switch fabric is configured to route each received train packet to a switch fabric output according to the SPP included in the header of each train packet; and

c) a plurality of packet deformatters for receiving routed train packets outputted from the switch fabric, extracting data packets from the payloads of the received routed train packets, and outputting the extracted data packets.

20. (currently amended) The switch of claim ~~19~~ 64 wherein each packet formatter comprises a packet queuer comprised of a plurality of waiting buffers for queuing data packets and a controller configured to (1) queue data packets in the waiting buffers according to their corresponding SPPs such that data packets sharing a common corresponding SPP are commonly-queued, and (2) for each waiting buffer, create a train packet therefrom by encapsulating in a train packet payload at least some of the data packets queued therein and

encapsulating the SPP shared by the data packets encapsulated in the train packet payload in a train packet header.

21. (original) The switch of claim 20 wherein each packet queuer further comprises a plurality of backlog buffers for queuing train packets, each backlog buffer corresponding to a waiting buffer, and wherein the controller is further configured to queue each train packet in a backlog buffer corresponding to the waiting buffer from which that train packet was created.

22. (original) The switch of claim 20 wherein each packet queuer is further configured to create a train packet from at least some of the data packets queued in a waiting buffer once the data packets queued therein have an aggregate length greater than or equal to a pre-selected maximum threshold value.

23. (currently amended) The switch of claim 20 wherein each packet queuer is further configured to maintain a plurality of pre-selected timer thresholds, each timer threshold being configured to control a different property in the creation of a particular train packet, and wherein the packet queuer is further configured to create a train packet from whatever is queued in a non-empty waiting buffer upon passage of ~~a~~ one of the plurality of pre-selected timer thresholds ~~period after which that waiting buffer became non-empty~~.

24. (original) The switch of claim 20 wherein at least one packet formatter further comprises a plurality of said packet queuers and a multiplexor for multiplexing the train packets created by said packet queuers.

25. (currently amended) The switch of claim ~~19~~ 64 wherein each train packet payload comprises a plurality of payload blocks, each payload block comprising a data portion and a control header portion, wherein the data portion comprises either a plurality of data packets, a single data packet, a portion of a data packet, padding, or some combination thereof, wherein the control header comprises deformatting information, and wherein each packet deformatter

is configured to extract data packets from the train packet payloads according to the deformatting information within the control headers of the payload blocks.

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28. (original) A switch for routing a plurality of data packets between a plurality of switch inputs and a plurality of switch outputs, each of said data packets having a corresponding switch processing parameter (SPP), said switch comprising:

a) a plurality of packet formatters, each of said packet formatters configured to (1) queue data packets according to their corresponding SPPs such that data packets sharing a common corresponding SPP are commonly-queued, (2) create subtrain packet sets from the commonly-queued data packets, each subtrain packet set comprising a plurality N of subtrain packets, each subtrain packet comprising a subtrain payload and a subtrain header, wherein the subtrain payloads of the subtrain packets in at least one subtrain packet set encapsulate a plurality of commonly-queued data packets in the aggregate, and wherein the subtrain header of each subtrain packet in each subtrain packet set includes the SPP shared by each data packet encapsulated in the aggregated subtrain payload of that subtrain packet set, and (3) for each subtrain packet set, output the subtrain packets included in that subtrain packet set in parallel;

b) a switch fabric for routing subtrain packet sets received from the packet formatters, said switch fabric comprising a plurality N of switch planes, each switch plane having a plurality of switch plane inputs for receiving subtrain packets from the packet formatters and a plurality of switch plane outputs for outputting subtrain packets, wherein each switch plane is configured to (1) receive a subtrain packet from each subtrain packet set, and (2) route each received subtrain packet to a switch plane output according to the SPP included in its subtrain header; and

c) a plurality of packet deformatters, each packet deformatter configured to (1) receive routed subtrain packet sets from the switch fabric, and (2) extract from the received subtrain packet sets the data packets encapsulated therein.

29. (currently amended) The switch of claim ~~28~~ 70 wherein each packet formatter comprises a packet queuer for creating train packets from commonly-queued data packets and a slicing unit for creating subtrain packet sets from the train packets created by the packet queuer, each packet queuer comprising a plurality of waiting buffers for queuing data packets and a controller configured to (1) queue data packets in the waiting buffers according to their corresponding SPPs such that data packets sharing a common corresponding SPP are commonly-queued, ~~and~~ (2) for each waiting buffer, create a train packet therefrom by encapsulating in a train packet payload at least some of the data packets queued therein and encapsulating the SPP shared by the data packets encapsulated in the train packet payload in a train packet header, and wherein the slicing unit is configured to, for each train packet created by the packet queuer, create N subtrain payloads for the N subtrain packets in a subtrain packet set by slicing the payload of a train packet into N slices.

30. (original) The switch of claim 29 wherein each packet queuer further comprises a plurality of backlog buffers for queuing train packets awaiting slicing by the slicing unit.

31. (original) The switch of claim 29 wherein each packet queuer controller is configured to create a train packet from at least some of the data packets queued in a waiting buffer once the data packets queued in that waiting buffer have an aggregate length equal to or exceeding a pre-selected maximum threshold value.

32. (currently amended) The switch of claim 29 wherein each packet queuer controller is configured to maintain a plurality of pre-selected timer thresholds, each timer threshold being configured to control a different property in the creation of a particular train packet, and wherein the packet queuer is further configured to create a train packet from whatever is queued in a non-empty waiting buffer upon passage of ~~a~~ one of the plurality of pre-selected timer thresholds ~~after which that waiting buffer became non-empty~~.

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35. (original) The switch of claim 29 wherein at least one packet formatter further comprises a plurality of said packet queuers and a multiplexor for multiplexing the train packets created by the plurality of said packet queuers upstream from the slicing unit.

36. (original) The switch of claim 29 wherein the slicing unit of each packet formatter is further configured to, for each subtrain packet set, encapsulate slicing information within the subtrain header of each subtrain packet within a subtrain packet set, wherein the switch planes in the switch fabric are configured to be synchronous with each other, and wherein each packet deformatter comprises a packet merger configured to reassemble the train packet payloads from which each received subtrain packet set was sliced according to the slicing information encapsulated in the subtrain packet headers, and a packet restorer configured to extract each data packet from the reassembled train packet payloads.

37. (original) The switch of claim 29 wherein the slicing unit of each packet formatter is further configured to, for each subtrain packet set, encapsulate slicing information within the subtrain header of each subtrain packet within a subtrain packet set, wherein the switch planes in the switch fabric are configured to be asynchronous with each other, and wherein each packet deformatter comprises a packet merger configured to (1) queue subtrain packets received from the switch planes, wherein the subtrain packets in the same subtrain packet set are commonly-queued, and (2) for each queued subtrain packet set, reassemble the train packet payload from which that subtrain packet set was sliced according to the slicing information encapsulated in the subtrain packet headers, and a packet restorer configured to extract each data packet from the reassembled train packet payloads.

38. (original) A device for formatting data packets, said device comprising:

a) an input for receiving a plurality of data packets, each of said data packets having a corresponding switch processing parameter (SPP);

b) a packet queuer connected to said input, said packet queuer comprising a plurality of waiting buffers for queuing data packets therein and a controller configured to (1) queue each data packet in an appropriate waiting buffer according to its SPP such that data packets sharing a common SPP are commonly-queued, and (2) create train packets from the commonly-queued data packets, each train packet having a payload and a header, wherein the payload of at least one train packet is comprised of a plurality of commonly-queued data packets, and wherein the header of each train packet includes the SPP corresponding to each data packet within the payload of that train packet.

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41. (original) The device of claim 38 wherein the packet queuer is further configured to create a train packet from the data packets queued in a waiting buffer if the data packets queued that waiting buffer have an aggregate length equal to or exceeding a pre-selected maximum threshold value.

42. (currently amended) The device of claim 38 wherein the packet queuer is further configured to create a train packet from whatever is queued in a non-empty waiting buffer once ~~a~~ one of two pre-selected threshold ~~amount of~~ time periods has passed since that waiting buffer became non-empty, wherein each of the two time periods controls a different function in the creation of train packets.

43. (original) The device of claim 38 wherein the packet queuer further comprises a plurality of backlog buffers for queuing train packets.

44. (original) The device of claim 38 further comprising a plurality of said inputs, a plurality of said packet queuers, wherein each packet queuer is receives data packets from a

different input, and a multiplexor connected to the plurality of packet queuers for multiplexing the train packets created from the packet queuers.

45. (original) The device of claim 38 further comprising a slicing unit for slicing each train packet created by the controller into a set of N subtrain packets, each subtrain packet comprising a subtrain payload and a subtrain header, wherein each subtrain payload comprises a portion of the train packet payload of the train packet from which the subtrain packet set was sliced, and wherein each subtrain header includes the SPP of the train packet header of the train packet from which the subtrain packet set was sliced.

46. (original) The device of claim 45 wherein the slicing unit is configured to encapsulate slicing information for the train packet within each subtrain header.

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49. (original) A multi-path switching system for routing data packets, said multi-path switch comprising a plurality of paths through which data packets are routed, wherein each path is associated with a distribution class and configured to route data packets corresponding to said distribution class, and wherein at least one of the paths is comprised of a switch according to claim 19.

50. (original) The multi-path switching system of claim 49 wherein at least one of the paths is comprised of a switch according to claim 28, wherein the path that is comprised of the switch according to claim 28 is a different path than the path that is comprised of the switch according to claim 19.

51. (original) A multi-path switching system for routing data packets, said multi-path switching system comprising a plurality of paths through which data packets are routed,

wherein each path is associated with a distribution class and configured to route data packets corresponding to said distribution class, and wherein at least one of the paths is comprised of a switch according to claim 28.

52. (original) A multi-path switching system for routing data packets, each data packet having a corresponding switch processing parameter (SPP), said multi-path switching system comprising:

a plurality of packet queuers for creating train packets from data packets sharing a common SPP, each train packet having a payload and a header, wherein the payload of at least one train packet comprises a plurality of data packets sharing a common SPP, and wherein header of each train packet includes the SPP corresponding to each data packet comprising the payload of that train packet;

a plurality of traffic distributors for receiving train packets from the packet queuers and distributing each received train packet to at least one of a plurality of paths according to a predetermined set of distribution criteria;

each path comprising a switch fabric for routing train packets according to their SPPs; and

a plurality of packet deformatters for receiving train packets routed by the switch fabrics and deformatting each routed train packet by extracting data packets from each train packet payload.

53. (original) A multi-path switching system for routing data packets, each data packet having a corresponding switch processing parameter (SPP), said multi-path switching system comprising:

a plurality of packet queuers for creating train packets from data packets sharing a common SPP, each train packet having a payload and a header, wherein the payload of at least one train packet comprises a plurality of data packets sharing a common SPP, and wherein header of each train packet includes the SPP corresponding to each data packet comprising the payload of that train packet;

a plurality of traffic distributors for receiving train packets from the packet queuers and distributing each received train packet to at least one of a plurality of paths according to a predetermined set of distribution criteria;

wherein at least one of said paths comprises a slicing unit for receiving train packets from the traffic distributors and slicing each received train packet into a set of N subtrain packets, and a switch fabric having a plurality N of switch planes, each switch plane for routing a different subtrain packet within a subtrain packet set; and

wherein said switch fabric within said at least one path comprising said slicing unit is linked to a plurality of packet deformatters for receiving subtrain packets, reassembling the train packets from which the subtrain packets were sliced, and extracting data packets from the reassembled train packets.

54. (currently amended) A device for routing data packets, each data packet having a corresponding switch processing parameter (SPP), said device comprising:

a) means for receiving a plurality of data packets;

b) means for queuing said received data packets into a plurality of data packet queues according to their corresponding SPPs such that data packets sharing a common corresponding SPP are commonly-queued;

c) means for creating train packets from commonly-queued data packets, each train packet comprising a payload and a header, wherein the creating means is configured to (1) encapsulate a plurality of commonly-queued data packets within the payload of at least one train packet and (2) encapsulate the SPP corresponding to each data packet encapsulated in the train packet payload within the train packet header, wherein said creating means is in circuit with said queuing means; and

d) means for routing each train packet <u>through a switch fabric</u> as specified by its encapsulated SPP, wherein said routing means is in circuit with said creating means.

55. (currently amended) A device for routing data packets, each data packet having a corresponding switch processing parameter (SPP), said device comprising:

a) means for receiving a plurality of data packets;

b) means for queuing said received data packets into a plurality of data packet queues according to their corresponding SPPs such that data packets sharing a common corresponding SPP are queued within the same data packet queue;

c) means for creating train packets from commonly-queued data packets, each train packet comprising a payload and a header, wherein the train packet creating means is configured to (1) encapsulate a plurality of commonly-queued data packets within the payload of at least one train packet and (2) encapsulate the common SPP corresponding to each data packet encapsulated in the train packet payload within the train packet header, wherein said train packet creating means is in circuit with said queuing means;

d) means for creating a set of N subtrain packets from each train packet created by the train packet creating means, each subtrain packet comprising a subtrain payload and a subtrain header, wherein said subtrain packet set creating means is configured to (1) create subtrain payloads by slicing each train packet payload into N slices, wherein each slice comprises a subtrain payload, and (2) encapsulate within each subtrain header the SPP encapsulated within the train packet header of the train packet from which the set of subtrain packets was sliced;

e) means for routing each subtrain packet within a set of subtrain packets through a different switch plane of a switch fabric within the routing means as specified by its encapsulated SPP.

56. (original) A switch for routing data packets between a plurality of switch inputs and a plurality of switch outputs, said switch comprising:

a) a plurality of first level SPP mappers for determining a corresponding first level SPP for each data packet and attaching said determined first level SPP thereto;

b) a plurality of first level packet formatters for queuing together data packets sharing a common corresponding first level SPP, creating first level train packets from the commonly-queued data packets, wherein each first level train packet comprises a payload and a header, wherein the payload of at least one first level train packet includes a plurality of commonly-queued data packets, and wherein the header of each first level train packet includes

the common first level SPP corresponding to each data packet included in the payload of that first level train packet;

c) a plurality of second level SPP mappers for determining a corresponding second level SPP for each first level train packet and attaching said determined second level SPP thereto;

d) a plurality of second level packet formatters for queuing together first level train packets sharing a common corresponding second level SPP, creating second level train packets from the commonly-queued data packets, wherein each second level train packet comprises a payload and a header, wherein the payload of at least one second level train packet includes a plurality of commonly-queued first level train packets, and wherein the header of each second level train packet includes the common second level SPP corresponding to each first level train packet included in the payload of that second level train packet;

e) a plurality of multiplexors, each multiplexor linking a plurality of first level packet formatters to a second level packet formatter;

f) a switch fabric having a plurality of switch fabric inputs for receiving second level train packets from the second level packet formatters and a plurality of switch fabric outputs for outputting routed second level train packets, wherein the switch fabric is configured to route each received second level train packet to a switch fabric output according to the second level SPP included in the header of each second level train packet;

g) a plurality of second level packet deformatters for receiving routed second level train packets outputted from the switch fabric, extracting first level train packets from the payloads of the received routed second level train packets, and outputting the extracted first level train packets;

h) a plurality of first level packet deformatters for receiving extracted first level train packets outputted from the second level packet deformatters, extracting data packets from the payloads of the received extracted first level train packets, and outputting the extracted data packets; and

i) a plurality of demultiplexors, each demultiplexor linking a second level packet deformatter with a plurality of first level packet deformatters.

57. (original) A switch for routing data packets between a plurality of switch inputs and a plurality of switch outputs, said switch comprising:

a) a plurality of first level SPP mappers for determining a corresponding first level SPP for each data packet and attaching said determined first level SPP thereto;

b) a plurality of first level packet formatters for queuing together data packets sharing a common corresponding first level SPP, creating first level train packets from the commonly-queued data packets, wherein each first level train packet comprises a payload and a header, wherein the payload of at least one first level train packet includes a plurality of commonly-queued data packets, and wherein the header of each first level train packet includes the common first level SPP corresponding to each data packet included in the payload of that first level train packet;

c) a plurality of second level SPP mappers for determining a corresponding second level SPP for each first level train packet and attaching said determined second level SPP thereto;

d) a plurality of second level packet formatters, each of said second level packet formatters configured to (1) queue first level train packets according to their corresponding second level SPPs such that first level train packets sharing a common corresponding second level SPP are commonly-queued, (2) create subtrain packet sets from the commonly-queued first level train packets, each subtrain packet set comprising a plurality N of subtrain packets, each subtrain packet comprising a subtrain payload and a subtrain header, wherein the subtrain payloads of the subtrain packets in at least one subtrain packet set encapsulate a plurality of commonly-queued first level train packets in the aggregate, and wherein the subtrain header of each subtrain packet in each subtrain packet set includes the second level SPP shared by each first level train packet encapsulated in the aggregated subtrain payload of that subtrain packet set, and (3) for each subtrain packet set, outputting the subtrain packets included in that subtrain packet set in parallel;

e) a plurality of multiplexors, each multiplexor linking a plurality of first level packet formatters to a second level packet formatter;

f) a switch fabric for routing subtrain packet sets received from the second level packet formatters, said switch fabric comprising a plurality N of switch planes, each switch

plane having a plurality of switch plane inputs for receiving subtrain packets from the second level packet formatters and a plurality of switch plane outputs for outputting subtrain packets, wherein each switch plane is configured to (1) receive a subtrain packet from each subtrain packet set, and (2) route each received subtrain packet to a switch plane output according to the second level SPP included in its subtrain header; and

g) a plurality of second level packet deformatters, each second level packet deformatter configured to (1) receive routed subtrain packet sets from the switch fabric, (2) extract from the received subtrain packet sets the first level train packets encapsulated therein, and (3) output each extracted first level train packet;

h) a plurality of first level packet deformatters for receiving extracted first level train packets outputted from the second level packet deformatters, extracting data packets from the payloads of the received extracted first level train packets, and outputting the extracted data packets; and

i) a plurality of demultiplexors, each demultiplexor linking a second level packet deformatter with a plurality of first level packet deformatters.

58. (new) The method of claim 1 further comprising:

classifying the received data packets to determine a corresponding switch processing parameter (SPP) for each received data packet; and

wherein the queuing step comprises queuing the plurality of the classified data packets into a plurality of data packet queues according to their corresponding SPPs such that data packets sharing a common corresponding SPP are commonly-queued.

59. (new) The method of claim 6 wherein a second of the plurality of timer thresholds is configured to define a minimum amount of time that at least one data packet will be queued before a train packet having padding will be created.

60. (new) The method of claim 5 wherein each train packet has a fixed length, and wherein the train packet creating step comprises creating a train packet having padding if the

one timer threshold expires and an aggregate length of the queued data packets is less than the fixed train packet length.

61. (new) The method of claim 10 further comprising:

classifying the received data packets to determine a corresponding switch processing parameter (SPP) for each received data packet; and

wherein the queuing step comprises queuing the plurality of the classified data packets into a plurality of data packet queues according to their corresponding SPPs such that data packets sharing a common corresponding SPP are queued within the same data packet queue.

62. (new) The method of claim 15 wherein a second of the plurality of timer thresholds is configured to define a minimum amount of time that at least one data packet will be queued before a train packet having padding will be created.

63. (new) The method of claim 14 wherein each train packet has a fixed length, and wherein the train packet creating step comprises creating a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets is less than the fixed train packet length.

64. (new) The switch of claim 19 further comprising a plurality of SPP mappers in communication with the packet formatters, the SPP mappers being configured to classify the data packets to determine the SPPs for each data packet.

65. (new) The switch of claim 64 wherein each SPP comprises an identifier for a switch fabric output.

66. (new) The switch of claim 65 wherein each SPP further comprises an identifier of a priority for each data packet.

67. (new) The switch of claim 23 wherein each train packet has a minimum length, and wherein the packet queuer is further configured to create a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets is less than the minimum train packet length.

68. (new) The switch of claim 67 wherein a second of the plurality of timer thresholds is configured to define a minimum amount of time that at least one data packet will be queued before the packet queuer creates a train packet having padding.

69. (new) The switch of claim 23 wherein each train packet has a fixed length, and wherein the packet queuer is further configured to create a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets is less than the fixed train packet length.

70. (new) The switch of claim 28 further comprising a plurality of SPP mappers in communication with the packet formatters, the SPP mappers being configured to classify the data packets to determine the SPPs for each data packet.

71. (new) The switch of claim 70 wherein each SPP comprises an identifier for a switch plane output.

72. (new) The switch of claim 71 wherein each SPP further comprises an identifier of a priority for each data packet.

73. (new) The switch of claim 32 wherein each train packet has a minimum length, and wherein the packet queuer is further configured to create a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets does is less than the minimum train packet length.

74. (new) The switch of claim 73 wherein a second of the plurality of timer thresholds is configured to define a minimum amount of time that at least one data packet will be queued before the packet queuer creates a train packet having padding.

75. (new) The switch of claim 32 wherein each train packet has a fixed length, and wherein the packet queuer is further configured to create a train packet having padding if the one timer threshold expires and an aggregate length of the queued data packets is less than the fixed train packet length.

76. (new) A packet switch for processing a plurality of data packets, each data packet comprising a payload portion and a header portion, each data packet having a switch processing parameter (SPP) associated therewith, the packet switch comprising:

a plurality of packet formatters within the packet switch; and

a switch fabric within the packet switch, the switch fabric in communication with the packet formatters;

wherein the switch fabric comprises a plurality of switch fabric input ports and a plurality of switch fabric output ports;

wherein the packet formatters are configured perform one selected from the group consisting of sequential train packet processing and sequential-to-parallel train packet processing on a plurality of received data packets and their associated SPPs to thereby generate a plurality of packets for receipt by the switch fabric input ports, each generated packet having an associated SPP; and

wherein the switch fabric is configured to receive the generated packets and switch each received generated packet from a switch fabric input port to a switch fabric output port according to its associated SPP.

77. (new) The packet switch of claim 76 wherein the switch fabric comprises a plurality of parallel switch planes, and wherein the packet formatters are configured to perform sequential-to-parallel train packet processing on the received data packets and their associated SPPs to

thereby generate a plurality of train packets which are in turned sliced into a plurality of subtrain packets for receipt by the switch fabric input ports.

78. (new) The packet switch of claim 76 wherein the packet formatters are configured to perform sequential train packet processing on the received data packets and their associated SPPs to thereby generate a plurality of train packets for receipt by the switch fabric input ports.

79. (new) The packet switch of claim 78 wherein each train packet has a payload portion, at least a plurality of the payload portions of the train packets encapsulating both at least one data packet payload portion and at least one data packet header portion.

80. (new) The packet switch of claim 78 wherein each packet formatter comprises a plurality of buffers for queuing data packets according to their associated SPPs such that any data packet that is queued in a buffer shares a common associated SPP with each other data packet that is also queued in that buffer, and wherein the packet formatter is further configured to maintain a plurality of timer thresholds such that each buffer has a plurality of timer thresholds associated therewith, each buffer's timer thresholds governing different conditions under which train packets are created from any data packets that are queued in that buffer.

81. (new) The packet switch of claim 78 wherein the packet formatters are further configured to define a minimum length for train packets.

82. (new) The packet switch of claim 81 wherein each packet formatter comprises a plurality of buffers for queuing data packets according to their associated SPPs such that any data packet that is queued in a buffer shares a common associated SPP with each other data packet that is also queued in that buffer, and wherein the packet formatter is further configured to maintain a timer threshold that defines a minimum amount of time that at least one data packet will be queued in a buffer before the packet formatter creates a train packet having padding.

83. (new) The packet switch of claim 78 wherein each packet formatter comprises a plurality of buffers for queuing data packets according to their associated SPPs such that any data packet that is queued in a buffer shares a common associated SPP with each other data packet that is also queued in that buffer, and wherein the packet formatter is further configured to maintain a plurality of parameters that govern train packet creation from any data packets that are queued in the buffers, the plurality of parameters comprising a maximum train packet length, a minimum train packet length, a maximum amount of time that a data packet may be queued in a buffer for a train packet that is created from that buffer, and a minimum amount of time that a data packet will be queued in a buffer before the packet formatter creates a train packet having padding, wherein the maximum amount of time is greater than the minimum amount of time.

84. (new) The packet switch of claim 83 wherein the parameters are defined for each buffer independently of the other buffers.

85. (new) The packet switch of claim 83 wherein at least one packet formatter is further configured to, if a queual of an arriving data packet in a buffer, the buffer having a content of at least one data packet that is already queued therein, would cause an aggregate length of data packets queued in that buffer to exceed that buffer's maximum train packet length, create a train packet from that buffer's content but not the arriving data packet, wherein the created train packet includes padding if an aggregate length of the buffer's content does not equal or exceed that buffer's minimum train packet length, and wherein the at least one packet formatter is further configured to queue the arriving train packet in a buffer for a subsequent transformation into a train packet.

86. (new) The packet switch of claim 83 wherein at least one packet formatter is further configured to, if a queuing of an arriving data packet in a buffer, the buffer having a content of at least one data packet that is already queued therein, would cause an aggregate length of data packets queued in that buffer to exceed that buffer's maximum train packet length, create a train packet from that buffer's content and a portion of the arriving packet sufficient to cause

the created train packet to have a length equal to the maximum train packet length, and wherein the at least one packet formatter is further configured to queue a remainder portion of the arriving train packet in a buffer for a subsequent transformation into a train packet.

87. (new) The packet switch of claim 78 further comprising a plurality of SPP mappers in communication with the packet formatters, each SPP mapper being configured to determine the SPP associated with each data packet, each SPP comprising an identification of a switch fabric output port.

88. (new) The packet switch of claim 87 wherein each SPP further comprises a priority for its associated data packet.